

USDA SHALLOW WATER MANAGEMENT FOR WILDLIFE



Conservation Practice Job Sheet

646

Natural Resources Conservation Service (NRCS)

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WHAT IS SHALLOW WATER MANAGEMENT FOR WILDLIFE?

Managing shallow water on agricultural fields and moist soil areas can provide open water areas for waterfowl resting and feeding. Proper management can increase and maintain desirable foods for waterfowl and other species of wildlife.

Shallow water areas are typically flooded during the winter and drained or dried during the spring or summer to promote the growth of desirable native food plants, or to plant crops that will benefit wildlife. After the seed producing plants have matured, and during the fall waterfowl migration, the area is allowed to flood to a depth of 1 to 18 inches of water. The flooded food plants provides excellent resting and feeding areas for "puddle ducks" that "tip" to feed like mallard, shoveler, pintail, and teal. The optimum feeding depth for these ducks is 4 to 10 inches.

Canada geese will also feed in shallow water areas within their wintering range. In the spring during a slow draw down, shallow water areas (mud flats to 4 inches deep) are especially beneficial for shorebirds, like plovers and sandpipers, on their northward migration.

VEGETATION MANAGEMENT

There are three basic ways to provide quality wildlife foods through vegetation management. They are 1) natural moist soil plants, 2) planting a crop for wildlife and 3) management of crop residue. Advantages of moist soil management over planting crops are:

- Management cost are less
- Attracts greater diversity of wildlife
- Provides foods with greater nutrient value
- Possible on marginal row crops sites
- Production less influenced by weather



Advantages of planting crops are:

- Total energy production can be higher
- Does not require as precise of water control
- Easier to control undesirable plant species

Each shallow water area may be managed using different methods in different years. In some cases, altering the type of management can facilitate maintenance and increase productivity and diversity of the site.

Natural moist-soil plants. Wild millet, rice cutgrass, nutgrasses, smartweeds, beggarticks, etc., can be encouraged, through water level manipulations, to germinate from existing seed sources in the soil and produce an abundant source of high quality food for waterfowl.

Drawdown (dewatering) of the area is necessary for moist soil plant production. Slow drawdowns (2-3 weeks) usually are more desirable for plant establishment and wildlife use. Early drawdowns (first 45 days of growing season) and midseason drawdowns (at least 90 days **before the end** of the growing season) result in the greatest quantity of seeds produced.

Consider the species of seed that is likely to exist in the soil when determining the species of food plants for which you are going to manage. The species of seeds in the soil, the timing of the

drawdown, as well as the type of drawdown, will determine plant species composition. See Table 1 for the response of common moist-soil plants to time of drawdown. In general, early slow drawdowns result in smartweeds and sedges, while midseason drawdowns produce millets and beggarticks.

The timing and extent of the draw down should be varied from year to year to maintain productivity and a diverse plant community. See Figure 1 for suggested annual flooding strategies.

Shorebirds, like plovers and sandpipers, feed on mud flats and very shallow water (0 to 4 inches) during the time of an early to midseason drawdown. Therefore, managed shallow water areas can be a very important source of food for shorebirds during their spring migration.

Undesirable species that should be controlled include cocklebur, reeds canarygrass, phragmites (common reed), maidencane, cattail, woody vegetation, and all noxious weeds including purple loosestrife. Most other plants that volunteer will be readily utilized by waterfowl.

If cocklebur volunteers, it can be controlled by a brief period of reflooding. Mowing and/or burning or disking during the growing season, then flooding until the following spring can usually control other undesirable species, including tree seedlings.

Annual species have the highest seed production, therefore, to maintain the site in early successional species (mostly annuals), and to control unwanted species, it is best to dewater and disk the site every 3 years.

After the moist soil plants have produced seed in late summer or fall, reflood the site slowly to coincide with the arrival of fall migrant waterfowl. Flooding the site slowly (2-3 weeks) allows new areas of food to become available each day at the preferred water depth as the water is rising.

Planting waterfowl food plants. Draw down in late spring and plant species such as browntop

millet, buckwheat, Japanese millet, grain sorghum, or corn. Fertilize for good production. Use of herbicides is generally not required since annual weeds produce useable wildlife food. After the crop has matured in late summer or fall, reflood the site slowly to coincide with the arrival of fall migrant waterfowl.

Crop residue. Utilize crop residue and waste grain after crops are harvested. Reflood the site slowly after harvest, to coincide with the arrival of fall migrants.

OTHER MANAGEMENT CONSIDERATIONS

Disturbances. Human activities in and around the management unit can have a significant impact on the behavior of wildlife. Activities with loud overwater movement cause the most disturbance, while quiet shoreline activities cause the least. Disturbances cause waterbirds to move to other feeding grounds, and may lower their productivity of nesting or brooding. Limit human disturbances while waterbirds are present. Consider screened buffer zones to separate disturbances (roads) from the site.

Buffers. In many locations the shallow water area may benefit from a permanent vegetative buffer around it. Filter strips can limit sediment from entering the area. A border of grasses and legumes will buffer the area from surrounding land uses and provide additional wildlife habitat.

Disease. Mass die-offs of waterfowl can occur at a particular site due to disease. A common Illinois disease that occurs around shallow water areas is avian botulism. It can be rapidly transmitted from dead birds to healthy birds by infected maggots. Prompt removal and disposal of dead birds and fish can control the spread of the disease. Flooding sites that have been dry for a long time, in summer when temperatures are high, is generally not recommended except for shorebird management. Under these conditions the bacterium that causes botulism can flourish.

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Table 1. Response of common moist-soil plants to drawdown date.

Species			Drawdown date		
Family	Common name	Scientific name	Early ^a	Midseason ^b	Late ^c
Grass	Swamp timothy	<i>Heleocholea schoenoides</i>	+ ^d	+++	+
	Rice cutgrass	<i>Leersia oryzoides</i>	+++	+	
	Sprangletop	<i>Leptochloa sp.</i>		+	+++
	Crabgrass	<i>Digitaria sp.</i>		+++	+++
	Panic grass	<i>Panicum sp.</i>		+++	++
	Wild millet	<i>Echinochloa crusgalli</i> var. <i>frumentacea</i>	+++	+	+
	Wild millet	<i>Echinochloa walteri</i>	+	+++	++
	Wild millet	<i>Echinochloa muricata</i>	+	+++	+
	Red-rooted sedge	<i>Cyperus erythrorhizos</i>		++	
Sedge	Chufa	<i>Cyperus esculentus</i>	+++	+	
	Spikerush	<i>Eleocharis spp</i>	+++	+	+
	Pennsylvania smartweed	<i>Polygonum pennsylvanicum</i>	+++		
Buckwheat	Curltop ladysthumb	<i>Polygonum lapathifolium</i>	+++		
	Dock	<i>Rumex spp.</i>		+++	+
	Sweetclover	<i>Melilotus sp.</i>	+++		
Pea	Sesbania	<i>Sesbania exalta</i>	+	++	
	Cocklebur	<i>Xanthium strumarium</i>	++	+++	++
Composite	Beggarticks	<i>Bidens spp.</i>	+	+++	+++
	Aster	<i>Aster spp.</i>	+++	++	+
Loosestrife	Purple loosestrife	<i>Lythrum salicaria</i>	++	++	+
	Toothcup	<i>Ammannia coccinea</i>	+	++	++
Morning glory	Morning glory	<i>Ipomoea spp.</i>	++	++	
Goosefoot	Fat hen	<i>Atriplex spp.</i>	+++	++	

a Drawdown completed within the first 45 days of the growing season.

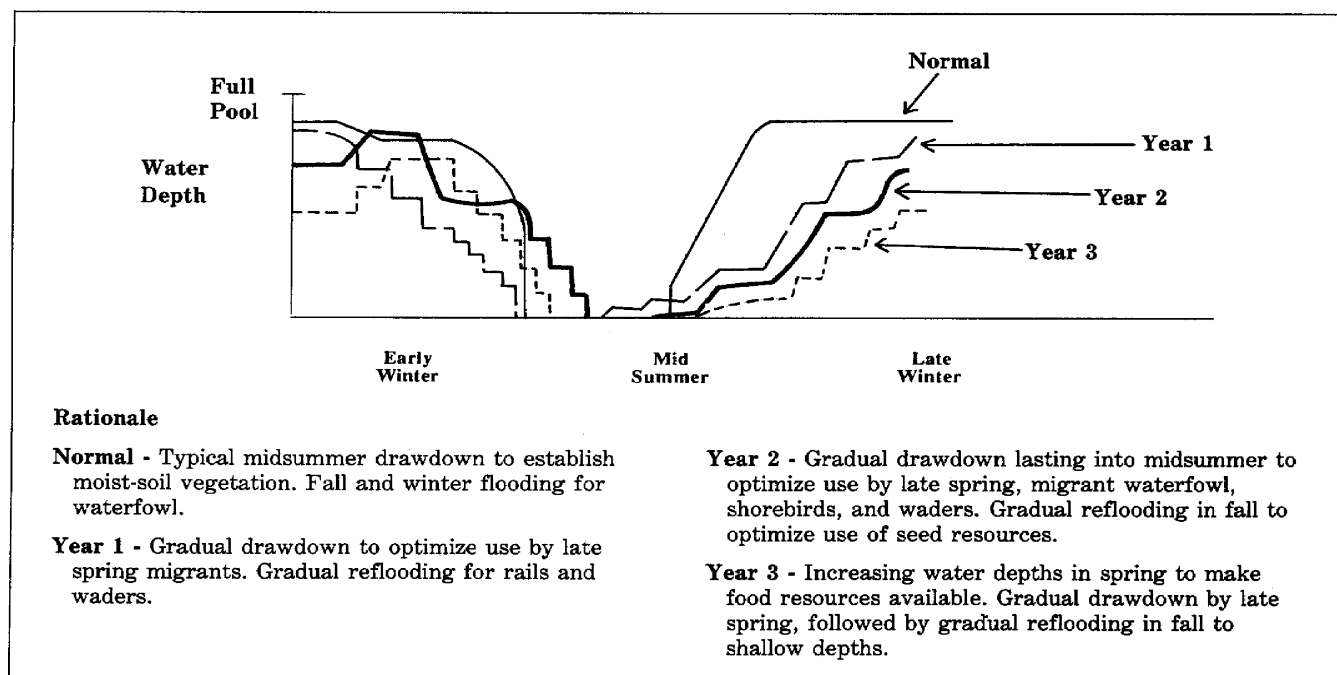
b Drawdown after first 45 days of growing season and before 1 July.

c Drawdown after 1 July

d + = fair response; ++ = moderate response; +++ = excellent response.

Fish and Wildlife Leaflet 13.4.6. • 1991

Figure 1. Suggested Flooding Regimes for Seasonally Flooded Wetlands of the Midwest.



Fish and Wildlife Leaflet 13.2.1. • 1988

SHALLOW WATER MANAGEMENT FOR WILDLIFE DESIGN WORKSHEET

Farm: _____

Field: _____

Shallow Water Unit: _____

Date: _____

Structural Components Required

Source of water: (Check if required and see engineering design for site)

_____ Diversion.	_____ Water control structure on tile line, ditch, or dike.
_____ Pond/reservoir	_____ Other source to be developed
_____ Well with pump.	_____ Surface water (Seasonal flood events and/or surface runoff is usually sufficient)
_____ Pump.	

Dikes required: (see engineering design for site)

Average height _____ Total length _____. Total cubic yards _____.

Seeding Required:

_____ Acres of seeding on dikes. See Job Sheet 327 or 342 (circle one).

_____ Acres of seeding for buffer strips. See Job Sheet 327.

Management Recommendations (Schedule one of the following 3 management methods each year)

Moist Soil Management

- Slow drawdown starting on or about:

1st year _____; 2nd year _____; 3rd year _____

- Leave drained over summer for moist soil plants to grow.
- Allow shallow water area to gradually refill as waterfowl migrate through the area, start refilling on:

1st year _____; 2nd year _____; 3rd year _____

- Maintain shallow water over winter. Vary water depth from year to year.
- Every three years disk at the start of the growing season. If undesirable plants become established, disk 2 or 3 times by mid summer then immediately flood (if possible) until the following spring.

Crops Planted For Waterfowl

Year	Planting Date	Crop	Rate	Fertilizer
_____	_____ May-June _____	Corn/grain sorghum	6-8 lbs/ac.	80-100 lbs. N
_____	_____ June - early July _____	Millet (Japanese, browntop)	20 lbs/ac.	30 lbs. N

- Gradually flood unit, maintaining the active feeding area 4 - 10 inches deep, as waterfowl migrate through the area in the fall.
- Leave flooded through the winter.

Crop Residue Managed For Waterfowl

In the following years conventional crops will be grown and harvested with the crop residue left for wildlife. After harvest flood the majority of the area 4 to 10 inches deep, to coincide with the arrival of waterfowl in the fall.

Year(s) _____ Crop(s) _____